MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TIS3351 – ADVANCE DATABASE

(All sections / Groups)

20 OCTOBER 2016
9.00 a.m. – 11.00 a.m.
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages, including the cover page, with four questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the answer booklet provided.

Question 1 [10 marks]

Foodplay is a shop that sells kitchenware. Below is the *Product* table of the company with *ProductID* as the primary key.

PRODUCT

ProductID	ProductName	Category	UnitPrice	Supplier
P1001	Muffin Pan	Baking	45.00	1009
P1002	Cookie Cutter Set	Baking	25.00	1009
P2009	Spaghetti Jar	Storage	19.00	1007
P3001	Cupcake Stand	Serveware	39.00	1008
P4002	Meat Mincer	Accessory	69.00	1007
P4003	Citrus Juicer	Accessory	29.00	1007
P4006	Digital Thermometer	Accessory	35.00	1005

Answer the following questions based on the table above.

a) Which attribute in *Product* table can be defined using a CHECK constraint? Write the SQL code to support your answer.

[2 marks]

b) Write the SQL command to show the information of the most expensive product in *Foodplay*.

[2 marks]

c) Given the *Product* table above, write the SQL statement to produce the following result:

[2 marks]

Category	Supplier	Sum_of_Price
-	-	261.00
Accessory	-	133.00
Baking	-	70.00
Serveware	-	39.00
Storage	-	19.00
Accessory	1005	35.00
Accessory	1007	98.00
Baking	1009	70.00
Serveware	1008	39.00
Storage	1007	19.00

Continued...

d) Trigger, stored procedure and user-defined function are three types of procedural SQL. Give two differences of trigger and stored procedure.

[2 marks]

e) Write a stored procedure that adds 6% Government Service Tax (GST) to the unit price of all products. The rate of GST should be an input argument of the stored procedure.

[2 marks]

Question 2 [10 marks]

a) What are the main components of an OLAP? And, there are different architectures for OLAP system. Draw the architecture that provides the best performance.

[4 marks]

b) *Foodplay* would like to enhance its marketing by using an Online Analytical Processing (OLAP) system. The operational database of *Foodplay* is running on relational database engine. The data size of the company is considered medium-sized and the company has limited budget to implement the OLAP system.

Between Relational OLAP (ROLAP) and Multidimensional OLAP (MOLAP), which one is more suitable for *Foodplay*? Explain your answer.

[3 marks]

c) What the three main areas that define the differences between decision support data and operational data?

[3 marks]

Continued...

Question 3 [10 marks]

a) In order to support the OLAP system, *Foodplay* has to first develop a data warehouse. *Foodplay* has a few branches across Malaysia and it is noticeable that certain products sell better in certain months of the year.

Identify three suitable dimensions and a fact table for *Foodplay*'s data warehouse. Draw the complete star schema.

[4 marks]

b) NoSQL database is widely implemented in Big Data applications. What is NoSQL database? Give two advantages and disadvantages of NoSQL database.

[3 marks]

c) MongoDB is a document-based database system. How is relationship between entities being implemented in MongoDB? Explain your answer using an example.

[3 marks]

Question 4 [10 marks]

a) In temporal database, a relation can be illustrated based on the valid time of the tuples. The following tuples describe the candidature period of postgraduate students in a faculty in MMU. Illustrate *Candidature* relations of these tuples in a temporal database.

- Candidate 10020 enrolled for PhD program PG001 from year 2010 to 2015.
- Candidate 11001 enrolled for PhD program PG001 from year 2014 to 2019.
- Candidate 11002 enrolled for Master program PG002 from year 2012 to 2019.
- Candidate 11009 enrolled for Master program PG002 from year 2012 to 2015.
- Candidate 11011 enrolled for PhD program PG001 from year 2015 to 2020.
- Candidate 11012 enrolled for Master program PG002 from year 2016 to 2019.

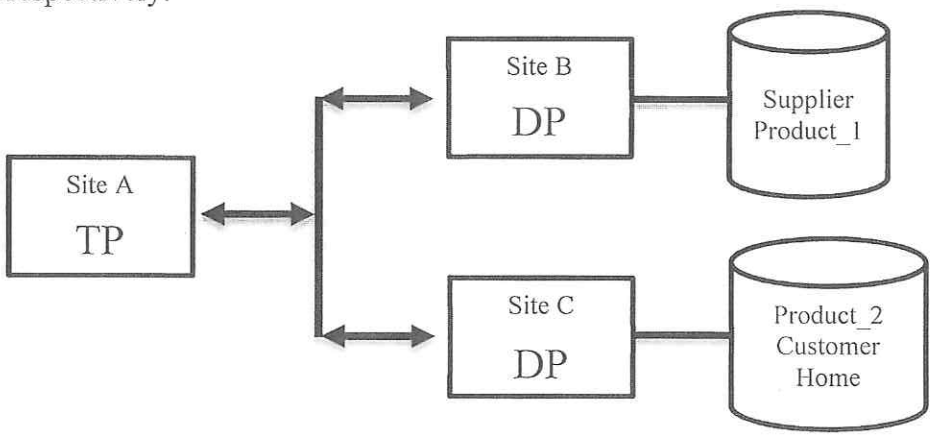
[2 marks]

b) In multimedia database system, there are three main methods of retrieving multimedia information, which are attribute-based, text-based and content-based. What is the difference between attribute-based and text-based retrieval systems?

[2 marks]

Continued...

c) Assume that *Foodplay* stores its operational database in a distributed environment, across Site A, B and C. The locations of some of the tables in the database are illustrated below. Note that the *Product* table has fragments 1 and 2, located at Site B and C respectively.



Identify the minimum operation type(s) (remote request, remote transaction, distributed transaction, or distributed request) that the distributed database management system must support in order to perform the following operations at Site A. Explain your answer.

i) SELECT * FROM Product WHERE Price < = 50;

[1 mark]

ii) SELECT * FROM Customer WHERE CustomerID IN ('C001','C002');

[1 mark]

iii)
```
BEGIN WORK;
   UPDATE Supplier
   SET Status = 'Local'
   WHERE Supplier_Location = 'Malaysia';

   UPDATE Supplier
   SET Status = 'Oversea'
   WHERE Supplier_Location <> 'Malaysia';
COMMIT WORK;
```

[1 mark]

d) Transform the Product table of *Foodplay* in Question 1 into an XML document, named as *ProductList.xml*. Include only the first two rows in your answer.

[3 marks]

End of Page.